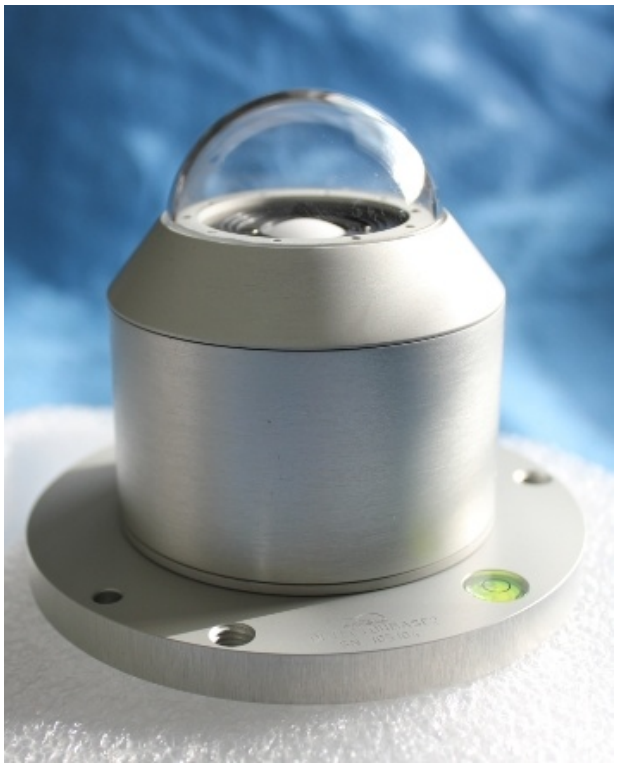
Calibration of instruments for radiation measurements
Measurement of radiation from UV to IR
Software for special requirements

The Austrian
Calibration Measurement Software Company

J1034-UV-A/B/E DETECTOR
USER'S MANUAL



Precision is our business

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USER INFORMATION

Thank you for using the UV broadband detector. Make sure to read this instruction manual thoroughly and to understand the contents before starting to operate the instrument. Keep this manual at safe and handy place for whenever it is needed.

For any questions, please contact us at the CMS office given below.

CMS reserve the right to make changes to specifications without prior notice.

Warranty

For warranty terms and conditions, contact CMS or your distributor for further details.

CMS guarantees that the product delivered to customer has been verified, checked and tested to ensure that the product meets the appropriate specifications. The product warranty is valid only if the product has been installed and used according to the directives provided in this instruction manual.
CMS shall in no event be liable for incidental or consequential damages arising from the faulty and incorrect use of the product.
In case of any manufacturing defect, the product will be repaired or replaced under warranty. However, the warranty does not apply if:

- Any modification or repair was done by any person or organization other than CMS service personnel.
- The damage or defect is caused by not respecting the instructions of use as given on the product brochure or the instruction manual.

Contact Information

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SAFETY INFORMATION

This product is designed and manufactured under the consideration of the safety precautions. Please make sure to read and understand this instruction manual thoroughly in order to be able to operate the instrument safely and in the correct manner.

Warning /Caution

Setup

- The installation base should have enough load capacity for the instrument to be mounted. Fix the equipment securely. Otherwise, the instrument may drop due to gale or earthquake which may lead to unexpected accidents.
- Make sure the instrument and the cables are installed in a location where they will not get soaked.

Voltage Warning

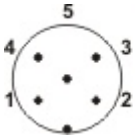
Power Supply

- Make sure to check the power supply voltage and type (AC/DC) before connecting the device to the power supply. Connecting the device to other power supplies than specified will lead to damage and accidents

GENERAL DESCRIPTION

This manual outlines the UV-A, UV-B, UV-E, UV-AB and UV-A/UV-E Broadband Detectors for measuring precise global UV irradiance for different spectral ranges. The system provides a considerably improved measurement accuracy in comparison to the traditional detectors. The direct cosine error f_2 is typically less than 1.5%.
The detectors are flexible enough to be easily installed on every measurement site. Detector base plates for individual alignment work and a shadow ring system 'J1033-SCHADOWRING' make an effective meteorological system.

Technical Data

	UV-E	UV-B	UV-A	UV-AB	UV-A / UV-E
Relative spectral response	ISO 17166:1999/ CIE S 007/E: 1998	265-315 nm	310-400 nm	280-400 nm	See individual detectors
Type	Single band				Dual band
Cosine error f_2	<1.5%				
Cosine Response	< 2.5% between 0°and 70° solar zenith angle				
Measure range	0 – 0.6 W/m²	0 - 5 W/m²	0 - 100 W/m²	0 – 100 W/m²	0 – 0.5W/m² 0 - 100W/m²
Signal output	0 - 5 V (on request: 0 - 2.5 V)				
Temperature range	-40 °C ÷ +60 °C				
Temp. coefficient	0.1 % / K				
Power Supply	9 - 24 V / 0.75mA				
Time switch on	< 1 sec				
Linearity	< 1%				
Housing	Anodised aluminium, Quartz glass dome				
Dimension	80 mm (diameter D) x 88mm (height H) Leveling plate: 115 mm (D) x 88mm (H)				
Weight	< 1 kg				
Pin connection	 1: Vcc (white) 2: GND (brown) 3: N.C. (Gray) 4: output UV (yellow) 5; housing (sreen)				1: Vcc (white) 2: GND (brown) 3: UV-E_{AE} 4: UV-A_{AE} 5: Housing (screen)

Pin connection of all UV detectors

1 – Vcc	[white]	9 - 24 V / 0.75mA
2 – GND	[brown]	Ground for power supply and signal output
3 – N.C./Output UV	[gray]	not connected (single band) UV-E (dual band) output
4 – Output UV	[yellow]	UV-B, UV-A, UV-E, UV-AB output UV-A (dual band) output
5 – Housing		

Relative Spectral Response

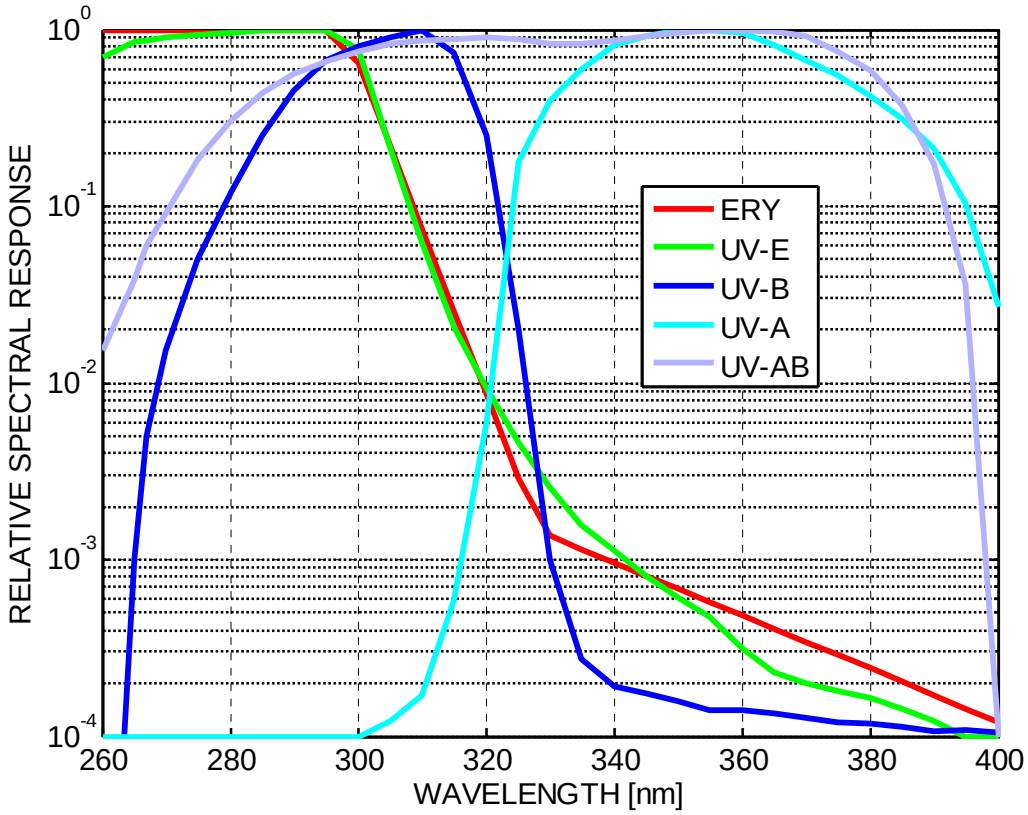


Figure 1 Relative Spectral Response of the single band detectors. Erythemal weighting function ERY defined @ ISO 17166:1999/ CIE S 007/E: 1998.

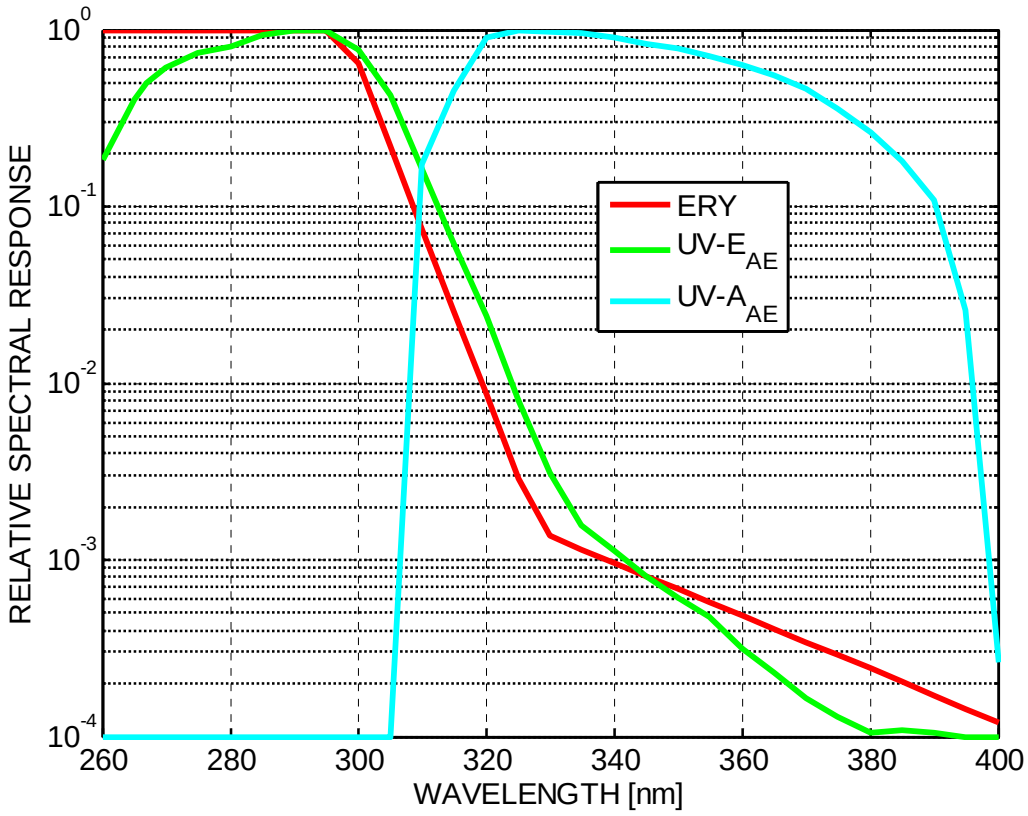


Figure 2 Relative Spectral Response of the dual band detector. Erythemal weighting function ERY defined @ ISO 17166:1999/ CIE S 007/E: 1998.

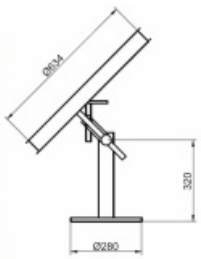
MOUNTING AND ALIGNMENT

The Detector should be aligned with the help of the spirit level and the montage screw and fixing screw. The sprit level is mounted inside the levelling plate. The following picture illustrates the components to align the detector correctly. To avoid measurement errors, the detector should be carefully levelled in the horizontal plane.
The additional available Detectorbase (105303) allows a robust and quick alignment of the detector do individual grounds.
Use the tilting screws to align the detector and control the correct settings with the help of the spirit level. After that use the montage screws to fix the detector to the ground.

Figure 3 UV detector mounted on Detectorbase (Art.No.: 105103) This part fits ideally to the J1033-Shadowring, which can be seen on the next page.

COMPONENTS, PARTS, REFERENCE

List of additional parts

Order No	Parts	Description
103401	UV-A	UV-A radiometer
103404	UV-B	UV-B radiometer
103406	UV-E	UV-E radiometer (erythemally weighted)
103410	UV-AB	UV-AB radiometer
103411	UV-A/UV-E	UV-A and UV-E radiometer (dual band)
103402	UV-10m	10 m weatherproof Cable connection for UV radiometers
105102	Power 12V	Plug in power supply 12VDC/2A
105103	DETECTORBASE	Detector base to hold detector in selected place
103304	J1033-SHADOWRING	Shadow ring for manually alignment. To measure diffuse part of solar radiation 
100229	Circlevel1	Circular spirit level

References

[1] WMO/GAW Report No. 141: Report of the LAP/COST/WMO Intercomparison of Erythemal Radiometers, Thessaloniki, Greece, 1999. WMO TD – No. 1051.

[2] WMO/GAW Report No. 146: Quality Assurance in Monitoring Solar Ultraviolet Radiation: the State of the Art. WMO TD – No. 1180.

[3] WMO/GAW Report No. 164: Instruments to measure Ultraviolet Radiation, Part 2: Broadband Instruments Measuring Erythemally Weighted Solar Radiation. WMO TD – No. 1289.

[4] ISO 17166:1999 / CIE S 007/E-1998: Erythema reference action spectrum and standard erythema dose.

[5] Schreder, J., J. Gröbner, A. Los, and M. Blumthaler, 2004: Intercomparison of monochromatic source facilities for the determination of the relative spectral response of erythemal broadband filter radiometers. Optics Letters, 29(13).

[6] G. Hülse, J. Gröbner, A. Bais, M. Blumthaler, P. Disterhoft, B. Johnsen, K.O. Lantz, C. Meleti, J. Schreder, J.M. Vilaplana Guerro, L. Ylianttila: Intercomparison of erythemal broadband radiometers calibrated by seven UV calibration facilities in Europe and USA. Atmos. Chem. Phys., 8, 4865-4875, 2008. http://www.atmos-chem-phys.net/8/4865/2008/acp-8-4865-2008.html.